An account of the other case I give in the words of Dr. Fitch: "The wood of the apple tree was formerly highly valued for cabinet work in this country. In 1786 a son of General Isaac Putman, residing in Williamstown, Mass., had a table made from one of his apple trees. Many years afterwards the gnawing of an insect was heard in one of the leaves of this table, which noise continued for a year or two, when a large long-horned beetle made its exit therefrom. Subsequently the same noise was heard again and another insect, and afterwards a third, all of the same kind, issued from this table-leaf; the first one coming out twenty and the last one twenty-eight years after the trunk was cut down." The proof of the identity of these beetles is not complete, but Professor Packard thinks they were *Cerasphorus balteatus*.

I find that *Eburia quadrigeminata* is not given in Hubbard and Schwarz's "List of Coleoptera found in the Lake Superior region," nor in the "Contribution to a list of Celeoptera of the Lower Peninsula of Michigan," by the same authors. But in Schwarz's "List of species" of Coleoptera found in Florida, *Eburia quadrigeminata* is mentioned as being "not rare on sugared trees in June." It is not given in LeConte's "List of species of Eastern New Mexico," but it is mentioned in his "List of species of Kansas and Nebraska." In his "New species of North American Coleoptera," he refers to it as "the ordinary *quadrigeminata* of the Southern States and the Mississippi valley." Thus, while it is a common enough insect over a large territory, no other case of its remarkable longevity seems to have been recorded. On comparing it with the other specimens in my collection, the only decided points of difference are the smaller size of the lateral spines of the prothorax and the terminal spines of the elytra; and the longer antennæ which, not exceeding the length of the body in the other specimens, are in this one one and a-half times as long.—*Jerome M'Neil, Indiana University, Oct. 26, 1886.*

ZOOLOGY.[1]

LEPTODORA IN AMERICA.—It may interest those of your readers who collect fresh-water Entomostraca to know that perhaps the most elegant and remarkable of that interesting group, *Leptodora hyalina*, Lillj., is much more abundant and easily obtainable than is implied by a note on page 896 of your last issue. First dredged by Professor S. I. Smith, in Lake Superior, in 1871, it was next found by me in June, 1877, in the Illinois river at Peoria, as reported in 1878, in Bull. 2, Vol. 1, of the Illinois State Laboratory of National History, p. 88. In the same bulletin I recorded its occurrence in the food of *Dorysoma cepedianum*, *Polyodon folium*, and *Hyodon tergisus*, all from the Illinois river. In our Bull. 3,

[1] Invertebrata edited by J. S. KINGSLEY, SC.D., Malden, Mass.

published in 1880, it is reported as eaten by young *Morone interrupta* and *Micropterus pallidus*, and again by Dorysoma. In the AMERICAN NATURALIST for August, 1882, it is further reported from both ends of Lake Michigan and from numerous small lakes—one only half a mile wide and not over twenty feet deep. In this lake, I remember, it was rather abundant. In Cedar lake, in Northern Illinois, we took it at night with Corethra larvæ, but we made our most notable haul of this species in Mendola lake, at Madison, Winconsin, where we captured hundreds in the towing net on a bright summer day in 1885. It may be expectingly sought wherever, in permanent and rather deep water, sufficient numbers of the smaller soft-bodied Entomostraca occur to give it a fair chance for prey. It is not a swift swimmer, and its food must be abundant.—*S. A. Forbes.*

BLOOD OF INVERTEBRATES.—Dr. Howell, in Johns Hopkins "Studies," describes the blood of the king-crab, soft-shell crab, and a species of holothurian. In Limulus the blood is alkaline, quickly coagulating. It contains fine albumens which coagulate at different temperatures but which all belong to the globulin group. They resemble but are not identical with paraglobulin. Coagulation in the blood of Limulus results by the union of the corpuscles, and the existence of a coagulative ferment has not yet been proved. The fibrin is much like that of mammals in its solubility. Hæmocyanin certainly contains copper. In Neptunus (= Callinectes), the blood is alkaline but coagulates less quickly than that of Limulus. It contains two albumens to be classed among the globulins, and the coagulation is more complete than in the king-crab. The fibrin is very different from that of Limulus, and of it Dr. Howell says: "The difference seems to me to be too wide to suppose any close relationship between the two forms, especially as they have the same general environments; but until a series of similar observations is made on the scorpion or some arachnid, we will not have sufficient evidence to make any just inferences with regard to the relationship of these forms—that is, from the standpoint here assumed." In the holothurian, which was identified as *Thyonella gemmata*, two kinds of corpuscles were recognized, a red, hæmoglobin-bearing nucleated oval form and a spherical white nucleated form Coagulation was occasioned by the fusion of the white corpuscles, the red not taking part in the formation of a coagulum except as they were entangled in the meshes of the other.

In another article in the same publication Dr. Howell notices the existence of hæmoglobin in this holothurian, the second discovery of this element of the blood in any echinoderm. It coagulates at a lower temperature (56°–60° C.) than that of vertebrates, and is precipitated by a one per cent solution of acetic acid. Foettinger's observations on the existence of hæmoglobin

in the aquiferous system of Ophiactis (Bull. Acad. Roy. Belgique, II, xlix, p. 402, 1880) appear to have escaped Dr. Horrell's notice.

THE BYSSAL ORGAN IN LEMELLIBRANCHS.[1]—The first portion of Dr. Barrois' article is a very full description of the byssal organs or its remains in forms from almost every family, twenty-one in all, and in forty-nine species of lamellibranchs. There is also a historical résumé of the subject, description of additional glands, and a discussion of the homologous organs in gasteropods.

In *Cardium edule* the organ is described in full and others are compared with it. Its parts are: 1. "The cavity of the byssus," a large space in the center of the keel of the hatchet-shaped foot. 2. "*The canal* of the byssus," opening on the surface by a pore. 3. "The byssus," a hyaline thread running out from the cavity through the canal. 4. "Byssal glands," glandular cells lying below the epithelium and opening separately into the cavity. 5. "The groove" running forward from the canal along the margin of the foot to the anterior end. 6 "Glandular cells of the groove" opening into it among the epithelium cells. The epithelium is everywhere perfectly continuous and in the cavity is thrown into numerous lamellar folds.

Various departures from the plan are described and figured; there may be no functional byssus but the other parts may all be present, or the groove, or the glands, or even the cavity may be wanting, or there may be in the adult no trace of any of the organs. In the same family or even genus wide variations may occur. Thus *Tapes virginea* has no functional byssus, the cavity, glands and lamellæ are present, while in *Venus rudis* and others of the family no trace of the apparatus remains. In *Anomia ephippium* the ossicle by which the animal is attached is a true byssus, formed in a cavity lined with lamellæ, a precisely similar one being present in the foot of *Arca tetragona*. The anomalies of its relation to the parts of the body are explained by the lateral attachment of the creature. The "*cornet*" of Anomia, with its groove leading to the byssal cavity, is similar to the muciparous gland on the anterior part of the foot of *Pecten maximus*. In Unio and Anodonta a cavity in the keel of the foot is the only remains of the byssal organ in the adult. This, doubtless the water pore of Kollmann, Griesback and others, is lined with continuous epithelium. It is to be regretted that lack of material has prevented research into the embryonic condition of many of the retrograde forms.

Barrois also describes as characteristic of the lamellibranchs special muciparous glands in the anterior portion of the foot; these in some cases line the inside of a cavity, *e. g.*, *Pecten maximus*, in other cases the organ being everted they line the

[1] Les Glandes du Pied et les Pores Aquiferes chez les Lamellibranches—Par le Dr. Ih. Barrois, Lille, 1885, pp. 160, pl. x.

outer surface under the epithelium of a pedunculated club-shaped body *e. g.*, *Lucina lactea.* The view that the byssus of the lamellibranchs is homologous with the gastropod operculum is rejected on anatomical and histological grounds, and the muciparous byssiparous glands are thought to correspond with the "Lippen-drüsen" and "Fusshöhledrüsen" of Carriere, the one upon the fore-end of the gastropod foot, the other upon the creeping surface.

The second portion of the work is a full historical and critical review of the "water-pore" controversy. No new observations of importance are recorded and the position maintained by the writer is the same as already represented in this journal (see Vol. III, p. 130).—*Henry Leslie Osborn, Purdue Univ., Lafayette, Ind.*

ON THE CLASS PODOSTOMATA, A GROUP EMBRACING THE MEROSTOMATA AND TRILOBITES.—In a paper read before the National Acad. of Sciences we have endeavored, by giving the history of the Xiphosura, Pœcilopoda and Gigantostraca, to show that while the name Xiphosura should be retained for the suborder of which Limulus is the type, the names *Pœcilopoda* and *Gigantostraca* have been applied in such different senses, that they can not well be retained for the Merostomata and Trilobita taken together in the sense we advocate. We have therefore proposed the term *Podostomata* for this class of Arthropoda. It is derived from *πούς, ποδός*, foot; and *στόμα*, mouth, in allusion to the feet-like or ambulatory nature of the cephalic appendages which surround the mouth in a manner characteristic of the group.

The class Podostomata may be defined as a group of marine arthropods in which the cephalic (Limulus) or cephalothoracic (trilobites) appendages are in the form of legs, *i. e.*, ambulatory appendages, usually ending in forceps or larger claws (chelæ), which in the sole living representative of the class are arranged in an incomplete circle around the mouth; the basal joint of each leg is spiny, so as to aid in the retention and partial mastication of the food. No functional antennæ, mandibles or maxillæ. Eyes both compound and simple. Respiration by branchiæ attached to the abdominal appendages which are broad and lamellate in Merostomata, and cylindrical with narrow gills in Trilobita. The brain supplying nerves to the eyes alone; the nerves to the cephalic or cephalothoracic appendages originating from an œsophageal ring; the ventral cord ensheathed by a ventral arterial system more perfectly developed than in insects or scorpions; coxal glands highly developed; with no external opening in the adult. The class differs from the Arachnida, among other characters, in having no functional cheliceres ("mandibles") or pedipalps ("maxillae"); in the cephalic appendages either ending in larger claws or forceps, or in being simple, the terminal joint not bearing a pair of minute claws or ungues like those of Arach-

nida and Insecta, enabling their possessors to climb as well as walk. Podostomata have no urinary tubes. Limulus undergoes a slight metamorphosis, while in trilobites the adult differs from the larva in having a greater number of thoracic segments.

From the Crustacea the Podostomata differ in the lack of functional antennæ, and mouth-parts; in the compound eyes having no rods or cones, in the brain innervating the eyes (compound and simple) alone; in the shape of the head and pygidium or abdominal shield, and in the arterial coat enveloping the central nervous cord.

The Podostomata are divided into two orders:

I. *Merostomata*, with three suborders: { *Xiphosura*, *Synziphosura*. *Eurypterida*.

II. *Trilobita*.

—*A. S. Packard.*

Oyster Culture.—Dr. J. A. Ryder has a paper on this subject in the Report of the U. S. Fish Commission, detailing the construction of apparatus for the artificial culture of oysters which, from a theoretical standpoint, certainly seems practical. His plans have been outlined in this magazine, and hence need not be repeated. One of the points brought out is that Lankester's beautifully illustrated paper on green oysters (Quart. J. M. S. xxvi, pp. 71–94, pl. vii, 1885) contains hardly an addition to our knowledge of this phenomenon, besides the conferring of the name marennin on the coloring matter absorbed. Almost every point made was previously published by Puységur, Descaine or Ryder from two to five years before.

Echinoderm Development.—Fewkes has some observations on the development of Ophiopholis and Echinarachnius. He shows that in the former genus the endoderm arises by an invagination, but he cannot state the relations the blastopore bears to either mouth or anus of the pluteus. The mesoderm arises symmetrically either side the blastopore and apparently is of the nature of mesenchym, though not so stated. Nothing is given concerning the development of the mesothelial tissues. Apostolides who has previously studied the development of Ophiurans comes in for some apparently merited criticisms. In the sand-dollar, Echinarachnius, the early development is much the same. The pluteus is compared with that of Strongylocentrotus, from which it differs in the presence of large pigment-spots on each arm and the absence of "ciliated epaulettes." The whole of the pluteus is absorbed in the young sand-dollar, which has a very different appearance from the adult. The development presents but slight differences from other echinoderms.

THE BRAZZA EXHIBITION AT PARIS.—An exhibition of the contents of eighty boxes brought from the French possessions on the Congo, by M. de Brazza, was opened June 30, of this year, in the orangery of the museum. Two species of chimpanzee, *Troglodytes tschego* and *T. aubryi; Colobus guereza* (not before known) from West Africa; a new species of Colobus *(C. thollous* M. Edw.); a new Cercopithecus *(C. brazzæ*, M. Edw.); *Cercocebus agilis* M. E. (nov. sp.), and a single form of lemur, *Galago demidoffi*, are among the mammals of the region. *Hypsignathus monstrosus* (the title of a very large and hideous bat); and *Anomalurus erythronotus* are also curiosities. Antelopes do not abound on the Congo, but *Tragelaphus gratus* inhabits the marshes which border the river, and *A. maxwelli* also occurs. The buffalo is *Bubalus equinoxialis*, smaller than *B. caffer*, but equally redoubtable. Birds of prey were well represented in the collection, which contained also numerous cuckoos, among which *Centropus savorgnani* and *Coccystes brazzæ* (Oustalet) are new to science. There was also a new swallow *(Phedina brazzæ)*. Most groups of African birds were well represented, but novelties do not appear to abound. Among the snakes were a new Heterolepis and a Microsoma. The collection of fishes added a Polypterus *(P. retropinnis* L. Vail.) of small size; and contained no less than twenty-three species of Characinidæ, several of which are new. It is a surprise to find this family, the headquarters of which is in South America, so abundant in West Africa. *Hydrocyon forskalii* reaches a length of two meters. Cyprinidæ were less numerous, among them were *Opsaridium fasciatum* L. Vail., resembling a sardine, and *Labeo coubie*, which grows to the length of a meter. Among fourteen species of Siluridæ *Doumea scaphyrhynchura* is new. No less than thirteen species of Mormyridae were represented. Acanthopteri are rare in the Congo region, but a few Chromidæ occur, among them *Acanthochromis regularis* and *A. seminudus* L. Vail. A species of flying fish, somewhat different from *Pantodon bucholzi* Peters, was among the curiosities. The fish are greatly infested with parasites.

Among the fresh water Crustacea M. Milne-Edwards has found five new species of Thelphusidæ.

Among insects the Coleoptera, and especially the Cetoniadæ, were best represented. Of the few molluscan specimens two species of Pharaonia seem to be new. There were many new species and some new genera of plants; while the ethnographical collection contained a very large number of objects, fetishes, pottery, pipes, iron and copper implements, articles in wood and ivory, etc. Two human skulls from Rio San Benito are remarkably dolichocephalic.

ZOOLOGICAL NEWS.—*Protozoa.*—Lankester reports in Nature (Sept. 2) the rediscovery of Archer's Chlamydomyxa which has

not been seen since its original description twelve years ago. He found it encysted in Sphagnum, and after a short delay it threw out its protoplasmic filaments and presented an appearance which leads Professor Lankester "to admit that it is *less* closely related to Cienkowski's Labyrinthula than I had previously supposed."——*Astrorhiza angulosa* a foraminifer dredged by the *Challenger* in a depth of one thousand fathoms, seventy miles east of the Açores, has been reported from the older Tertiary rocks of Victoria, Australia.

Sponges.—Dr. R. von Lendenfeld described the nervous system of several sponges at the recent meeting of the British Association for the advancement of Science. He called attention to the fact that in the sponges the most important organs are mesodermal (this is the case with the nerve cells) while in the Cœlenterates proper they are ecto- or ento-dermal. On the basis of this he proposes to divide the cœlenterates of Claus into Cœlenterata-Mesodermalia or sponges and Cœlenterata-Epithelaria or cœlenterates proper. It would seem as if these facts were an argument in favor of the view that the cœlenterates of Claus was not a natural group, a view for which there are many other reasons for adopting.

Cœlenterates.—Haddon states that his species *Halcampa andresii* is not valid but must stand as a synonym of *H. chrysanthellum* (Peach) Dana.——G. Y. Dixon gives some notes on *Edwardsia timida* with a colored plate showing the entire animal and some of the details. He regards *E. harasii* and *E. timida* as synonymous. His paper and that of Haddon are in Vol. v. of the Proceedings of the Royal Dublin Society.——At the meeting of the British Association, Dr. von Lendenfeld described the development of *Phyllorhiza punctata* of Australia. The ephyra has eight marginal sense bodies; at the next stage it has twenty-four, then sixteen, while the adult has only eight.——The same author further stated that *Crambessa masaica* goes up the Australian rivers at the breeding season to deposit its young, just as does the salmon. This species has remarkably changed its color at Port Jackson within fifty years. At that time it was blue, but now is superseded by a brown variety. At Port Phillip, only a few hundred miles to the south, the blue variety still persists.——Dr. C. A. MacMunn has a paper on the chromatology of certain Actinias in the 176th volume of the Philosophical Transactions. The observations were made by means of the micro-spectroscope and show the existence of a respiratory coloring matter allied to hæmogolbin and of a biliverdin which is probably concerned in excretion. Concerning the "yellow cells" the author states that the fact that they appear to cause a suppression of those pigments which in other Actineæ appear to discharge a respiratory function is an argument in favor of their being regarded as symbiotic algæ. Moseley's

actinochrome is regarded as decorative and is always confined to the tentacles. Another pigment is found in the eye spots which has a spectrum bearing some resemblance to that of a red pigment found in the eyes of certain insects.——Hickson has obtained the early stages of Tubipora. It is regularly holoblastic and there is an invaginate gastrula. He has also made some observations on a species of Clavularia from Celebes which go to show that this genus is closely allied to the fossil Syringopora, thus adding to the evidence that the latter is an Alcyonarian —— The absence of special buds or gonophores to contain the sexual products of Hydra is by Professor A. M. Marshall regarded as a highly modified character due to the influence of fresh water. In Cordylophora, the other fresh-water genus, the ova develop in a zone of germination round the necks of the zoöids, before either the gonophore or the branch on which it will be borne is developed. Afterwards the ova migrate into the gonophore. Evidently Cordylophora is in course of suffering a transformation into sexual conditions like those of Hydra. The normal Hydroida are bisexual and develop Medusæ.

Echinoderms.—According to recent researches by R. Koehler, the circulatory system of the ophiurans is much like that of the Echinoidea, the same relations being found in the madreporic gland, the rings around the mouth and the branches arising from them.

Worms.—A. Giard described a new Rhabdocœle, *Fecampia erythrocephala*, at the meeting of the Academy of Sciences of Paris, September 13. It is parasitic and forms a cocoon. Attention was called to the fact that it resembles a parasite found by Lang in the foot of the mollusk, Tethys, which will probably also be found to form a cocoon.——Professor W. C. McIntosh, in Nature, of September 16, thinks that Phoronis and Actinotrocha are more abundant on the British coasts than the records would indicate.——G. Fritsch, in the Sitzungsberichte of the Berlin Academy (Jan. 28, 1886, p. 99), describes and figures the parasites of the electrical cat-fish Malapterurus. The novelties are *Corallobothrium solidum*, nov. gen. et. sp., *Tænia malapteruri* and a nematode, *Trichosomum papillosum.*——Schoyen describes, in the Christiania Forhandlingar for 1885, a new species of trematode, *Tylenchus hordei*, which forms galls on the roots of grass in which the eggs are deposited——Dieffenbach, has an anatomical and systematical paper on Oligochæte worms in the Bericht of the Oberhessichen Gesellschaft for 1886. He describes the anatomy of *Lumbriculus variegatus* and of the Tubificidæ, and has notes upon the Naids. A new genus, Pseudolumbriculus, and two new species, *Ps. claparedianus* and *Pachydrilus lumosus* are described. ——Sluiter has a paper on the Gephyreans of the Malay archipelago in the Tijdschrift of the Dutch East India Society, Vol. XIV (1886). The paper enumerates thirty species as known from

that region, of which thirteen are now described for the first time. Some anatomical and histological notes are given.——Bell calls attention to the fact that in the land planarians the form of the head is very variable and cannot be used, as is often done, as a basis of generic division. He also states that Bipalium is sensitive to light, and if the light be too strong the specimen is killed.—— Collet describes (Proc. Zool. Socy., 1886) a new species of Echinorhynchus (*E. ruber*) from Rudolphi's rorqual (*Balænoptera borealis*). He suggests that its early stages may be passed in *Euphausia inermis*, one of the Thysanopoda.

Mollusks.—Mr. George W. Shrubsole (Journal of Conchology, v, 66, 1886) has some notes on erosion of fresh-water shells. He noticed that in specimens of Planorbis living in the Trent canal, the shell was entire, but after being kept for three months in water from the River Dee considerable erosion had taken place. This suggested that the character of the water might have a prominent place in the erosion, and analysis showed that the water of the Trent canal contained about three times as much lime in solution as that from the River Dee. The fact that erosion did not set in at once is explained by the existence of the epidermis.——Mr. Edgar A. Smith states that the genera Turtonia and Cyanium are distinct, the latter genus possessing an internal cartilage. Jeffreys had previously united them.

Brachiopods.—Miss Agnes Crane describes (Proc. Zool. Soc., London, 1886) a new species of brachiopod (*Atretia frazieri*) from Port Stephens, New South Wales.

Arachnida.—G. Saint-Remy, at the meeting of the Paris Academy, Sept. 20, presented the results of his studies of the brain of the spider based upon the genera Tegenaria, Epeira and Phalangium. The brains of these forms have the same general plan of organization as that of the scorpion, on which a report had previously been made.——Adolph Horn describes the poison apparatus of twenty-one species of spiders in the Bericht of the Oberhessichen Gesellschaft for 1886. The poison glands consist of two elongate cylindrical cœcal sacs enveloped in connective tissue and spirally arranged muscles. Their ducts terminate near the tips of the mandibles.——Grassi describes a new arachnid in the Bulletin of the Italian Entomological Society (Vol. XVII, 1886) under the name *Kœnenia mirabilis*. He regards it as the type of a new order, Microthelyphonida. In general appearance the form stands nearest the thelyphonids, as the name indicates. Grassi points out twenty-four points in which it differs from the whip scorpions.

Ascidians.—Sluiter describes fourteen new species of ascidians from Billiton island. For one of them a new genus, Styeloides, is proposed.

Crustacea.—Professor C. L. Herrick gives (Bull. Denison Univ.)

an account of various stages in the development and points in the morphology of *Limnetis gouldii* and *Chirocephalus holmani*, two phyllopodous Crustacea. He also describes *Nyocryptus setifer*, a mud-living cladocerous crustacean.——Packard describes (Proc. Philos. Soc., XXIII, 380) the feet in Cryptozoe, a new genus of fossil Phyllocaridan crustacean, allied to Nebalia. The figures are too poor to show any detail, but the feet, according to the text, are much like those of Nebalia. Nothing had been known of the nature of the feet in the fossil forms before.

Vertebrates.—The "Segmental value of the cranial nerves" is treated of histologically and argumentatively by Professor A. Milnes Marshall, in Vol. I of Studies from the Biol. Laboratories of Owens College. The following table expresses the results arrived at:

Segment.	*Nerve.*	*Visceral cleft.*	*Visceral arch.*
1. Præoral	I. Olfactory	Olfactory	
2. "	III. Oculo-motor IV. Trochlear	Lachrymal	
3. Oral	V. Trigeminal	Buccal	Maxillary.
4. Postoral	VII. Facial VI. Abducent	Spiracular or hyomandibular	Mandibular. Hyoid.
5. "	IX. Glossopharyngeal	1st branchial	1st Branchial.
6. "	X. Vagus, 1st branch	2d "	2d "
7. "	" 2d "	3d "	3d "
8. "	" 3d "	4th "	4th "
9. "	" 4th "	5th "	5th "
10. "	" 5th "	6th "	6th "
11. "	" 6th "	7th "	

The vagus supplies the six posterior branchial clefts in the Marsipobranchii and Notidanus, and is therefore considered equivalent to *at least* six segmental nerves. The XIth, or spinal accessory, and the XIIth, or hypoglossal nerves are not constant as cranial nerves throughout the vertebrate series, and are not dealt with in this paper.——By a study of the branchial sense-organs of Ichthyopsida, Dr. J. Beard endeavors to work out the same problem. He also finds eleven head-segments in sharks, but they differ from those of Professor Marshall, since the radix longa of the ciliary ganglion and the auditory are ranked as segmental nerves, the facial is allowed two segments, and the vagus four only.——To the first volume of Studies from the Biological Laboratories of Owens College, Professor A. Milnes Marshall contributes some observations on the cranial nerves of Scyllium. He does not attempt to determine the homologies between the nerves of Scyllium and those of higher vertebrates, preferring to wait for more

positive evidence.——Those interested in nervous anatomy may find an exhaustive article on the central nervous system of the baleen whales, by G. A. Guldberg, in the Forhandlingar of the Scientific Society of Christiania for 1885, published during the present year.——G. Fritsch describes the histology of the skin and the lateral-line organ of the electric cat-fish in the Sitzungsberichte of the Berlin Academy of Science for April, 1886.

ANTHROPOLOGY.[1]

AUSTRALIAN MEDICINE MEN.—In one respect it is unfortunate that the sorcerers among savages should be called "medicine men," they are not merely practitioners of medicine. Furthermore, all savage tribes have arrived at a certain stage of empirical medicine and know the healing and poisoning qualities of certain minerals and plants. The dawn of medicine, as of all else which we believe and practice, was in the day of the primitive savage.

We are concerned here with the doctor or medicine man, who, in Australia, Africa or America, relies upon his influence and power over the spirit world to work cure or to save life.

In our own country patient study is revealing much concerning this important class. Major Powell and several other gentlemen of the Bureau of Ethnology have paid personal attention to them. We are indebted to the London Anthropological Institute for the publication of important papers upon the "Blackfellow Doctors" of Australia, notably that of Mr. A. W. Howitt, in Vol. XVI, pp. 23–58. The men and women who in lower tribes stand for the clergy as distinguished from the laity, or uninitiated, are variously styled doctors, wizards or witches, sorcerers, seers or prophets, mediums, soothsayers, necromancers, rain-makers (better weather-makers), magicians, augurs, fortune-tellers, enchanters, priests, personators, diviners, etc.

Now these can readibly be divided into two classes or functions, viz., those who see into, understand and reveal the spirit world; and those who have more or less control over it, compelling it to do their bidding.

The medicine man, doctor, sorcerer, wizard, fetish man are all of the latter class. Whatever disease and death may be, whether merely the person or spirit of some noxious thing or an independently existing spirit, one of the powerful charmers can induce or compel it to do his bidding, either by direct command or by some diplomatic action called magic.

In the collection of material for a scientific investigation of this class of persons, I have found it convenient to adopt the following questions:

1. What are the actors called and what social rank do they hold.
2. By what rites or initiations do they attain to the privileges of their class.

[1] Edited by Prof. OTIS T. MASON, National Museum, Washington, D. C.